UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,352	10/25/2001	Ganesh Lakshminarayana	312/23	3787

27538 7590 01/28/2005	**EXAMINER**
KAPLAN & GILMAN , L.L.P. 900 ROUTE 9 NORTH WOODBRIDGE, NJ 07095	TRAN, NGHI V

ART UNIT	PAPER NUMBER
2151	

DATE MAILED: 01/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

	Application No.	**Applicant(s)**
Office Action Summary	10/004,352	LAKSHMINARAYANA ET AL.
	Examiner	**Art Unit**	
	Nghi V Tran	2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _25 October 2001_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-13_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-13_ is/are rejected.

7)☒ Claim(s) _8,10 and 12_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claims 8, 10, and 12 is objected to because of the following informalities:

With respect to claim 8, the phrase, "for each node ... in this step <u>c</u> ... said node

that are inferior" (emphasis added) appears to be a typo error for -- for each node ... in

this step a ... said node that are inferior--.

With respect to claim 10, the word, "SRLG" is understood for --Shared Risk Link

Groups--.

With respect to claim 12, the phrase, "The method ... <u>Dyjkstra's</u> algorithm"

(emphasis added) appears to be a typo error for --The method ... Dijkstra's algorithm".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Luo et

al., U.S. Patent Number 6,377,551 (hereinafter Luo).

With respect to claim 1, Luo teaches a method of calculating a blocking potential parameter for a potential working path in a communications network, the path being comprised of plural links (figure 1), the method comprising the steps of adding up a cost assigned to each link to form a first cost (column 4, lines 5-20; figure 1 i.e. the first number of link where k is a first cost; and figure 7) and adding up the total bandwidth of other communications paths which share resources with said potential working path to form a second cost (figures 1-2 and 8-11; column 4, lines 30-55; and column 6, lines 10-63 i.e. a second cost is Ci of the value in the pair (Pi, Ci)).

With respect to claim 2, Luo further teaches respecting to plural potential working paths (figures 8-11 i.e. 1-2-3-6, 1-4-5-6, or etc.), and discarding some of said plural working paths as inferior to leave a set of candidate working paths (figures 8-11; and column 6, lines 58-63 i.e. "the minimum cost path meeting the path constraint is 6-3-4-1" and discarding other plural working paths).

With respect to claim 3, Luo further teaches a potential working path is deemed inferior to a second path if both the sum of the cost assigned to each link in the potential working path and said blocking potential are both less than said cost assigned to each link and said blocking potential for said second path (figures 8-11; and column 6, lines 10-64).

With respect to claim 4, Luo further teaches combining the first and second costs

to form a third cost (figures 8-11; and column 6, lines 58-63 i.e. "the minimum cost path

meeting the path constraint is 6-3-4-1" is inherent as a third cost).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luo

as applied to claim 4 above, and further in view of Chaudhuri, U.S. Patent Number

6,324,162.

With respect to claim 5, Luo fails to teach calculating a protection path for each

candidate-working path.

In a method of calculating in a communications network, Chaudhuri discloses

calculating a protection path for each candidate-working path (column 4, lines 40-67;

and figure 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention was made to modify Luo in view of Chaudhuri by calculating a

protection path for each candidate-working path because this feature restores the fail

link in a timely fashion. It is for this reason that one of ordinary skill in the art at the time

of the invention would have been motivated to modify Luo in view of Chaudhuri in order

to find an alternate path to bypass the fail link.

With respect to claim 6, Luo fails to teach calculating a cost for each protection

path.

In a method of calculating in a communication network, Chaudhuri discloses

calculating a cost for each protection path (column 2, lines 1-5; column 4, line 40 -

column 5, line 15; and item 28 of figure 2 i.e. protection path is inherent as restore

path).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention was made to modify Luo in view of Chaudhuri by calculating a cost

for each protection path because this feature restores the fail link in a timely fashion. It

is for this reason that one of ordinary skill in the art at the time of the invention would

have been motivated to modify Luo in view of Chaudhuri in order to find an alternate

path to bypass the fail link.

With respect to claim 7, Luo fails to teach calculating a combined cost of said

working path and said protection path.

In a method of calculating in a communication network, Chaudhuri discloses

calculating a combined cost of said working path and said protection path (column 2,

lines 1-5; column 4, line 40 - column 5, line 15; and items 14 of figure 1 i.e. working

channels and spare channels).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention was made to modify Luo in view of Chaudhuri by calculating a

combined cost of said working path and said protection path because this feature allows

to check the entire bandwidth or capacity of the link. It is for this reason that one of

ordinary skill in the art at the time of the invention would have been motivated to modify

Luo in view of Chaudhuri in order to determine the entire bandwidth or capacity of the

link.

6.   Claims 8-9 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Luo et al., U.S. Patent Number 6,377,551 (hereinafter Luo), in view of Chaudhuri,

U.S. Patent Number 6,324,162.

With respect to claim 8, Luo teaches a method of provisioning working paths

from a source node to a destination node in a network, the network being comprised of

plural links, each of said links having an associated capacity, the network having

previously provisioned working paths and protection paths, the network also comprising

plurality of nodes that are interconnected by the links, the nodes having neighbors, the

method comprising the steps of:

        a.   calculating a cost of each working path from said source node to each

neighbor of said source node to achieve a set of candidate paths from said source to

each of said neighbors, the set of neighbors constituting initially a frontier (see abstract and figure 2 i.e. a frontier is interpret as predecssor);

   b.   pruning said set of candidate paths by removing inferior paths (column 6, lines 19-29 and figures 8-9);

   c.   for each node in the frontier or added to the frontier, calculating a cost working paths from said source node to each neighbor of said each node in the frontier and supplementing said candidate paths by adding to said candidate paths any of said working paths calculated in this step a that are less costly than candidate working paths from said source node to said neighbor of said node for which a cost has already been calculated, and discarding any candidate paths to said neighbor of said node that are inferior (column 6, lines 10-67 and figures 12-13);

   d.   adding all neighbors of said node for which a candidate path is calculated to the frontier (items 18 and 78 of figures 2 and 2 i.e. add k to L);

   e.   when step c has been executed for each node in the frontier, selecting an optimal working path (column 6 lines 58-64 i.e. "the minimum cost path meeting the path constraint is 6-3-4-1).

   However, Luo fails to teach a method of protection paths from source node to destination node in a network.

   In a method of calculating a communication network, Chaudhuri discloses a method of protection paths from source node to destination node in a network (column 4, lines 40-67; and figures 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention was made to modify Luo in view of Chaudhuri by adding a

protection paths from a source to destination node because this feature restores the fail

link in a timely fashion. It is for this reason that one of ordinary skill in the art at the time

of the invention would have been motivated to modify Luo in view of Chaudhuri in order

to find an alternate path to bypass the fail link.

With respect to claim 9, Luo further teaches calculating at least two values

associated with each path (figure 1 i.e. cost and delay).

With respect to claim 11, Luo fails to teach selecting a protection path for each of

said candidate working paths, assigning a protection cost to each protection path, and

calculating a combined cost by combining a cost of said protection path with a cost of

said each candidate working path.

In a method of calculating a communication network, Chaudhuri discloses

selecting a protection path for each of said candidate working paths (column 2, lines 1-

16), assigning a protection cost to each protection path (column 4, lines 40-67), and

calculating a combined cost by combining a cost of said protection path with a cost of

said each candidate working path (column 5, lines 1-39).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention was made to modify Luo in view of Chaudhuri by selecting,

assigning, and calculating a combined cost because this feature restores the fail link in

a timely fashion. It is for this reason that one of ordinary skill in the art at the time of the invention would have been motivated to modify Luo in view of Chaudhuri in order to find an alternate path to bypass the fail link.

With respect to claim 12, Luo fails to teach the protection paths are calculated using Dijkstra's algorithm.

In a method of calculation a communication network, Chaudhuri discloses the protection paths are calculated using Dijkstra's algorithm (column 4, lines 64-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Luo in view of Chaudhuri by using Dijkstra's algorithm because this feature is an efficiently algorithm to find the shortest paths. It is for this reason that one of ordinary skill in the art at the time of the invention would have been motivated to modify Luo in view of Chaudhuri in order to find the shortest paths from a given source to all points in a graph in the same time.

With respect to claim 13, Luo fails to teach protection paths are assigned a cost that accounts for the sharing of protection paths.

In a method of calculating a communication network, Chaudhuri discloses protection paths are assigned a cost that accounts for the sharing of protection paths (column 3, line 43 - column 4, line 39).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Luo in view of Chaudhuri by assigning a cost

to a protection paths because this feature restores the fail link in a timely fashion. It is for this reason that one of ordinary skill in the art at the time of the invention would have been motivated to modify Luo in view of Chaudhuri in order to find an alternate path to bypass the fail link.

7.   Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over both Luo and Chaudhuri, as applied to claim 9 above, and further in view of Doverspike et al., U.S. Patent Application Publication Number 2002/0097671 (hereinafter Doverspike).

With respect to claim 10, both Luo and Chaudhuri fail to teach at least one of said values is comprised of a blocking potential, representing the sum of bandwidths protected by the SRLG's that a candidate working path belongs to, and wherein an SRLG is a set of links that may fail based upon a single network fault.

In a method of calculating a communication network, Doverspike discloses the sum of bandwidths protected by the SRLG's that a candidate working path belongs to, and wherein an SRLG is a set of links that may fail based upon a single network fault (page 3, paragraphs 0019-0031).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify both Luo and Chaudhuri, and further in view of Doverspike by using SRLG to protect the sum of bandwidths because SRLG enhances backup tunnel path selection. It is for this reason that one of ordinary skill in the art at the time of the invention would have been motivated to modify both Luo and chaudhuri,

and further in view of Doverspike in order to avoid using links that are in the same

SRLG as interface the backup tunnel.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

        a.   "Restrictive costs in network systems," by Bauer, U.S. Patent Application

Publication Number 2001/0017845.

        b.   "Routing over large clouds," by Kalmanek, Jr. et al., U.S. Patent Number

6,711,152.

        c.   "Method and apparatus for eliminating unprotectable parths from

consideration during computation of a protectable shortest path tree," by Hillard et al.,

U.S. Patent Number 6,765,880.

        d.   "Fast restoration in optical mesh network," by Lu et al., U.S. Patent

Application Publication Number 2002/0191247.

        e.   "Method for routing in loaded telecommunication networks," by Blatt et al.,

U.S. Patent Number 6,816,585.

        f.   "Hop-by-hop routing with node-dependent topology information," by

Khotimsky et al., U.S. Patent Number 6,646,989.

        g.   "Method and system for providing an optimal path choice for differentiated

services," by Jeffries et al., U.S. Patent Application Publication Number 2002/0085495.

   h.   "Efficient precomputation of quality-of-service routes," by Rexford et al.,
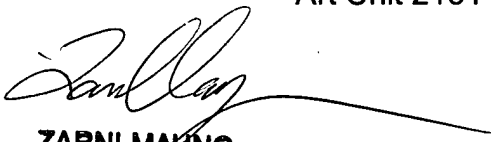
U.S. Patent Number 6,633,544.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Nghi V Tran whose telephone number is (571) 272-

4067. The examiner can normally be reached on Monday-Friday.

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Zarni Maung can be reached on (571) 272-3939. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

   Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

                                        Nghi V Tran
                                        Patent Examiner
                                        Art Unit 2151

NT

                        ZARNI MAUNG
               SUPERVISORY PATENT EXAMINER